

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 13

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte HORNG-HUEI TSENG

Appeal No. 1998-1100
Application No. 08/720,645

ON BRIEF

Before HAIRSTON, FLEMING, and LEVY, Administrative Patent Judges.

HAIRSTON, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 20 through 25.

The disclosed invention relates to a storage electrode of a capacitor for a DRAM cell on a semiconductor substrate. The storage electrode has an upright lower cylindrical portion, and a solid hemispherically-shaped upper portion that is

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centered over the cylindrical lower portion.

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Claim 20 is illustrative of the claimed invention, and it reads as follows:

20. A capacitor for a DRAM cell on a semiconductor substrate; said semiconductor substrate having a MOS transistor with a source region and a drain region; comprising:

a storage electrode having an upright lower cylindrical portion and a hemispherical shaped upper portion; said hemispherical shaped upper portion having

a hemispherical cross-sectional shape and a solid inside; said upright lower cylindrical portion in electrical contact with said source region in said substrate; said hemispherical shaped upper portion centered over said cylindrical lower portion; a capacitor dielectric layer

and a top electrode covering said storage electrode.

The references relied on by the examiner are:

Ahn	5,386,382	Jan. 31, 1995
Suganaga et al. (Suganaga)	5,539,231	Jul. 23, 1996
		(filed Mar. 2, 1995)

Claims 20 through 25 stand rejected under 35 U.S.C. § 103 as being unpatentable over Ahn in view of Suganaga.

Reference is made to the brief and the answer for the respective positions of the appellant and the examiner.

OPINION

The obviousness rejection of claims 20 through 25 is reversed.

All of the claims on appeal are directed to a capacitor for a DRAM cell that has a storage electrode with a solid hemispherically-shaped upper portion.

Ahn discloses a capacitor for a DRAM cell (Figures 1, 3B, 4C and 4D) that has a storage electrode with a square-shaped upper portion 100. A cavity is formed in the upper portion 100.

According to the examiner (Answer, pages 4 and 5), Suganaga discloses a hemispherically-shaped electrode. In view of the lack of any specifics, we assume the examiner is referring to the hemispherically-shaped portion 4 (Figures 1 and 10 through 13). In view of these teachings, the examiner concludes (Answer, pages 4 and 5) that it would have been obvious to one of ordinary skill in the art to substitute Suganaga's hemispherically-shaped electrode for the square-shaped upper portion 100 in Ahn because they are both functionally equivalent electrode shapes.

Appellant argues (Brief, page 9) that "Suganaga happens to show a long bitline interconnect 4 with rounded sidewalls - not hemispherical - in a contact area 10." Appellant also argues (Brief, page 10) that:

Even if combined, the references do not suggest applicant's hemispherical shaped capacitor. It is not obvious to extrapolate the combination of Ahn's square capacitor 100 and Suganaga's linear bit-lines 4 with rounded sidewalls to form applicant's hemispherical capacitors 50. It is not clear what the combination of the Ahn's square capacitor and Suganaga's] long interconnect line with rounded corners would yield since neither patent shows a hemispherical shape.

We agree with appellant's arguments. The above-noted figures in Suganaga appear to show a hemispherically-shaped electrode 4, but the plan view of Figure 15 reveals that the so-called hemispherically-shaped portion 4 is, as argued by appellant, a long interconnect line with rounded edges. In summary, we agree with appellant's argument (Brief, pages 10 and 11) that the examiner has used hindsight to make a "strained interpretation of the combination of Ahn and Suganaga," and that the examiner "has not presented a convincing line of reasoning as to why the claimed subject matter as a whole . . . would have been obvious."

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DECISION

The decision of the examiner rejecting claims 20 through
25 under 35 U.S.C. § 103 is reversed.

REVERSED

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KENNETH W. HAIRSTON)	
Administrative Patent Judge)	
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)	
)	BOARD OF PATENT
MICHAEL R. FLEMING))
Administrative Patent Judge)	APPEALS AND
)	
)	INTERFERENCES
)	
STUART S. LEVY))
Administrative Patent Judge)	

KWH:hh

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